



# **OPERATING INSTRUCTIONS**

## **Handling Components SERVOLINE® Servo Horizontal Axis SHA-340 without Servo motor Mechanical Part**

**BA-100002**

ENGLISH

Edition: 02/2008

## Change index

Editions issued so far:

<b>Edition</b>	<b>Comments</b>	<b>Order number</b>
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08/2005	Length-dependent articles replaces	BA-100002 A
12/2005	New Proximity switch	BA-100002 B
02/2006	Validity of the User Manual	BA-100002 C
02/2008	New type plate	BA-100002 D

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## 1 Important information

### 1.1 Introduction

This operating instruction describes the mechanical design, the load limits, installation, maintenance and spare parts of the Servo Horizontal Axis.

### 1.2 EU - conformance (to EU Directive on Machines, Appendix II A)

#### Regulations and standards taken into account:

- EU Directive on Machines 89/392/EEC, 91/368/EEC

#### Manufacturer:

Montech AG  
Gewerbstrasse 12                      Phone +41 (0) 32 681 55 00  
CH-4552 Derendingen              Fax     +41 (0) 32 682 19 77

### 1.3 Product description and application

The servo horizontal axis SHA-340 is designed for electrical operation. The position-controlled linear axis serves as a basic element for assembly of portal loaders. Depending on the size of the unit, movements along the x axis up to 400, 600, 800, 1000 or 1200 mm are possible. For example, Linear Units (LEP), Compact Universal Slides (KUS), Servo Vertical Axes (SVA) or Servo Vertical Units (SVE) can be fitted to carry out vertical movements. Units of other systems or any tool-bearing units can be attached as long as they do not exceed the load limits of the Servo Horizontal Axis SHA-340.

Servo Horizontal Axes SHA-340 which have been upgraded to portal loaders are suitable for many and varied tasks, such as loading of machines, small parts assembly, transposition, packaging, palletizing and parts supply from magazines containing workpieces.

### 1.4 Dangers

The use of Servo Horizontal Axis SHA-340 in equipment is permissible only when they are provided with protection by **movable, separating protective devices according to EN 292-2 Section 4.2.2.3**.

It is essential to observe the operating conditions and safety notes described in the operating instruction.

It is absolutely essential that you keep within the stated load limits.



- During maintenance work on the Servo Horizontal Axis, ensure that the drive power is switched off. The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.
- Switch off the enable signal
- Switch off the mains power (L1, L2, L3)
- Ensure that no unauthorized switching-on of the supply voltage can occur.
- Failure to observe these safety measures may result in death or severe personal injuries or material damage.

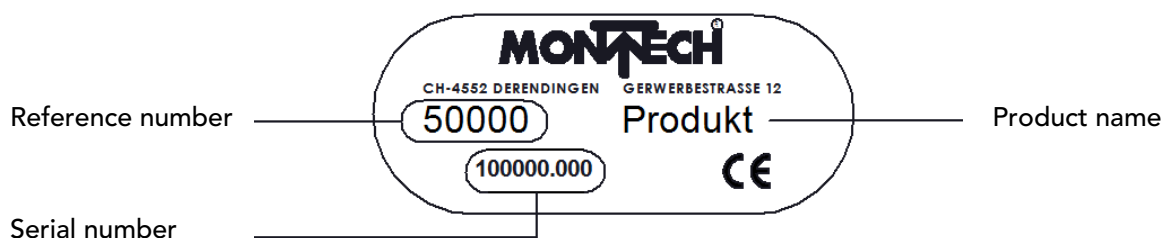
## 1.5 Additional information

The aim of the present User Manual is to enable users to employ Servo Horizontal Axis SHA-340 correctly and safely. Should further information be required in relation to your particular application, please contact the manufacturer.

When reordering User Manuals, it is essential to quote the reference number, the product name and serial number.

This document can be obtained from our homepage [www.montech.com](http://www.montech.com).

Fig. 1.5-1: Description type plate



Montech AG  
Management



U. D. Wagner



C. Wullschleger

## 1.6 Validity of the Operating Instructions

Our products are continually updated to reflect the latest state of the art and practical experience. In line with product developments, our User Manuals are continually updated.

Every User Manual has an order number (e.g. BA-100002) and an edition number (e.g. 02/2008). The order number and the addition number are shown on the title page.

### Validity table

Complete designation	Short designation	Art. No.
SHA-340-400 without Servo motor	SHA-340-400-OZ	51532
SHA-340-600 without Servo motor	SHA-340-600-OZ	56132
SHA-340-800 without Servo motor	SHA-340-800-OZ	56133
SHA-340-1000 without Servo motor	SHA-340-1000-OZ	56134
SHA-340-1200 without Servo motor	SHA-340-1200-OZ	56135

## 2 Technical data

		SHA-340-400-OZ	SHA-340-600-OZ	SHA-340-800-OZ	SHA-340-1000-OZ	SHA-340-1200-OZ
Max. stroke	[mm]	400	600	800	1000	1200
Max. permissible mounting mass	[kg]	8	8	8	8	8
Max. stat. moment $M_{0x\max}$	1) [Nm]	63	63	63	63	63
Max. stat. moment $M_{0y\max}$	1) [Nm]	18	18	18	18	18
Max. stat. moment $M_{0z\max}$	1) [Nm]	36	36	36	36	36
Max. stat. force $F_{x\max}$	1) [N]	400	400	400	400	400
Max. stat. force $F_{y\max}$	1) [N]	100	100	100	100	100
Max. stat. force $F_{z\max}$	1) [N]	450	450	450	450	450
Max. speed	2) [m/s]	2	2	2	2	2
Max. acceleration	3) [m/s <sup>2</sup> ]	10	10	10	10	10
Acceleration ramp		sin <sup>2</sup>	sin <sup>2</sup>	sin <sup>2</sup>	sin <sup>2</sup>	sin <sup>2</sup>
Own weight	[kg]	7.7	9.0	10.4	11.7	13.0
Reference position approach switch		Integrated inductive proximity switch PNP				
Ambient conditions: Ambient conditions	[°C]	10 ... 50				
Rel. humidity		5% ... 85% (without condensation)				
Air purity		normal workshop atmosphere				
Warranty period		2 years from the date of delivery				
Installation position		horizontal				
Material		aluminium, steel, plastic				

1) See load calculations

2) Relationship between the slide speed and the motor speed:

$$V_{\text{Schlitten}} = \pi \cdot d_w \cdot n_{\text{Motor}}$$

Slide speed	: $V_{\text{Schlitten}} \leq 2 \text{ m/s}$
Effective diameter of drive pinion	: $d_w = 35.01 \text{ mm}$
Motor speed	: $n_{\text{Motor}} \leq 1091 \text{ min}^{-1}$

3) At max. permissible installation mass and with a sin<sup>2</sup>-shaped ramp

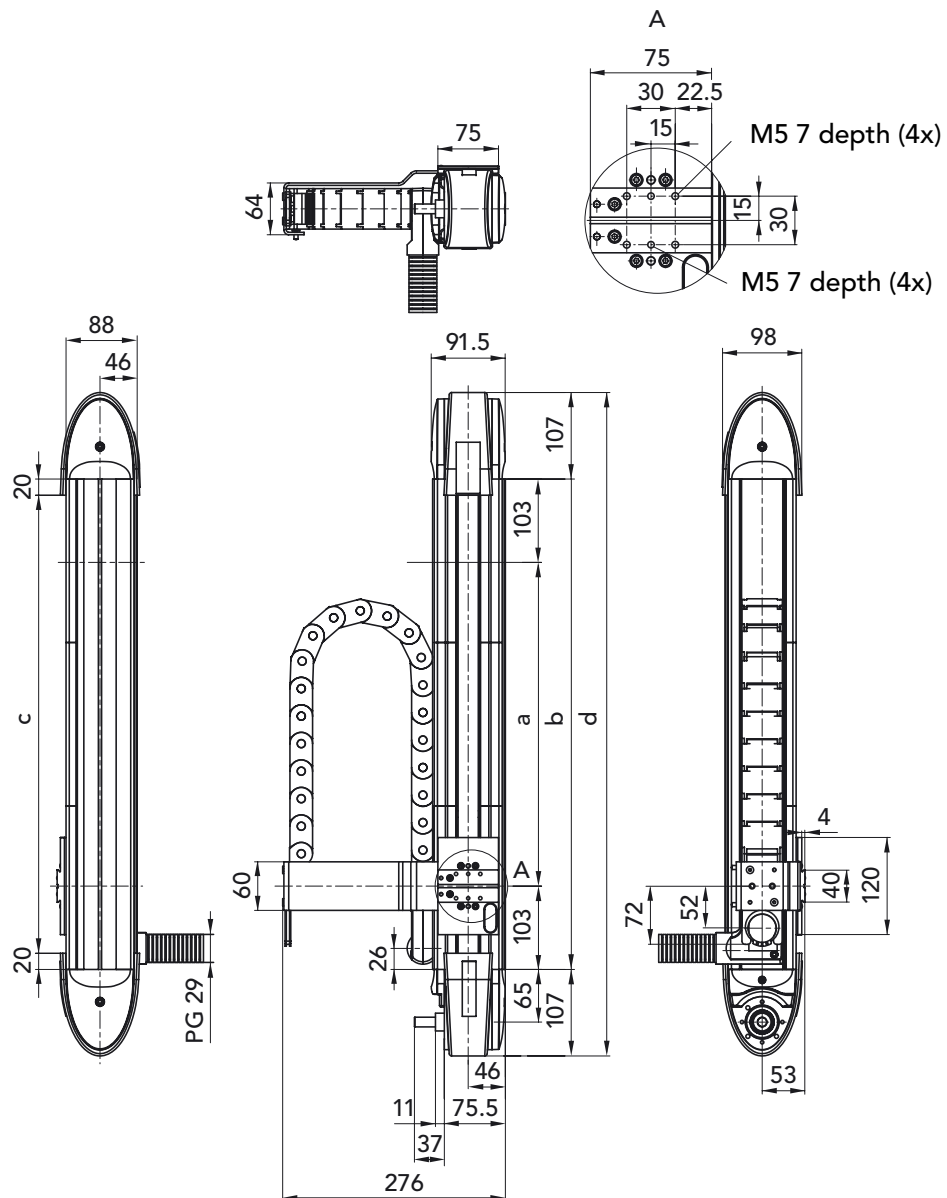


When adjusting the servo amplifier, it is essential to choose the acceleration ramp of the shape sin<sup>2</sup>. A trapezoidal ramp would mean premature wear of the guide.



## 2.1 Dimension sheet SHA-340 without servo motor

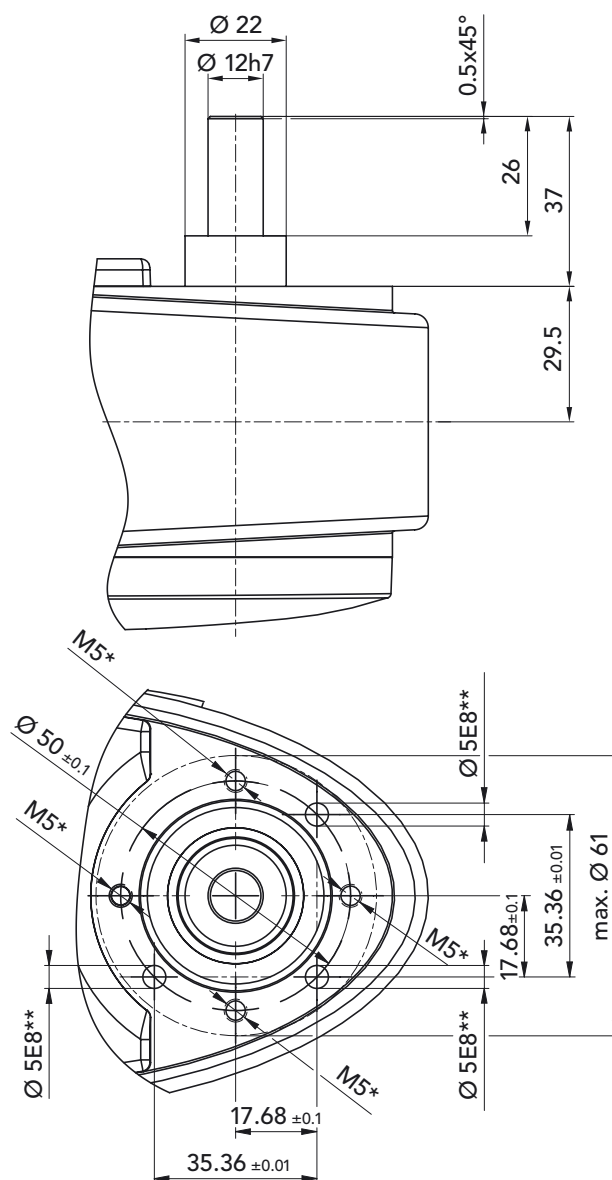
Fig. 2.1-1: Dimension sheet SHA-340-...-OZ



	a	b	c	d
SHA-340-400-OZ	400	606	566	820
SHA-340-600-OZ	600	806	766	1020
SHA-340-800-OZ	800	1006	966	1220
SHA-340-1000-OZ	1000	1206	1166	1420
SHA-340-1200-OZ	1200	1406	1366	1620

## 2.2 Dimension sheet SHA-340 without servo motor, detailed view of connection

Fig. 2.2-1: Dimension sheet SHA-340-...-OZ, detailed view of connection



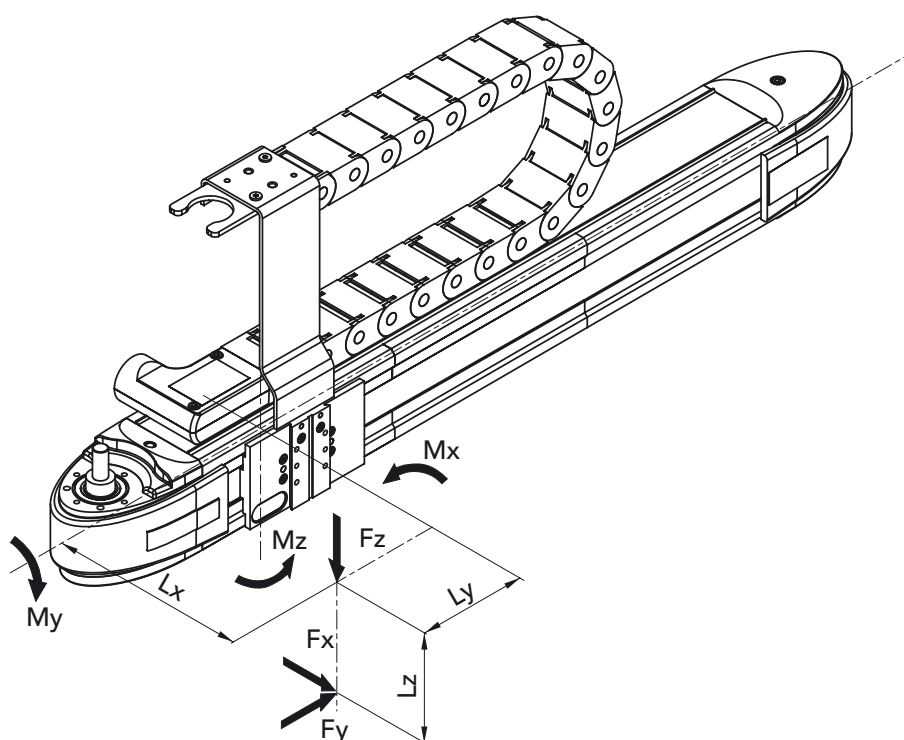
- \* 4 x M5: depth 11
- \*\* 3 x  $\varnothing 5E8$  : depth 7

## 2.3 Load calculations

The load calculations stated in the technical data are maximum values for a single load. The following calculations apply to the combined loads experienced in practical applications:

### Definition of the loads

Fig. 2.3-1: Definition of the loads



## Load calculations

### a) Dynamic load

$$M_x = 0.001 \cdot m \cdot a \cdot L_z + 0.01 \cdot m \cdot L_y$$

$$M_y = 0.01 \cdot m \cdot (L_x - 21)$$

$$M_z = 0.001 \cdot m \cdot a \cdot (L_x - 21)$$

#### Combined dynamic load:

$$B = \frac{M_x}{50} + \frac{M_y + M_z}{35} \leq 1$$

### b) Static load

$$M_{0x} = 0.001 \cdot (F_y \cdot L_z + F_z \cdot L_y)$$

$$M_{0y} = 0.001 \cdot [F_x \cdot L_z + F_z \cdot (L_x - 21)]$$

$$M_{0z} = 0.001 \cdot [F_x \cdot L_y + F_y \cdot (L_x - 21)]$$

#### Combined static load:

$$B_0 = \frac{M_{0x}}{63} + \frac{M_{0y}}{18} + \frac{M_{0z}}{36} \leq 1$$

<b>B, B<sub>0</sub></b>	Load factor: <b>Must not exceed the value 1!</b>
<b>M<sub>i</sub>, M<sub>0i</sub></b>	Existing moments [Nm]
<b>m</b>	Mounting mass [kg]
<b>L<sub>x</sub>, L<sub>y</sub>, L<sub>z</sub></b>	Distance of moving mass from centre of gravity, or force application distances [mm]
<b>F<sub>x</sub>, F<sub>y</sub>, F<sub>z</sub></b>	Acting forces [N], maximum values see «Technical Data»
<b>a</b>	Acceleration of the axis [m/s <sup>2</sup> ]

### 3 Installation

#### 3.1 Mechanical Structure

##### Designing the plant

When designing the plant, the following points must be taken into account:

- The Servo Horizontal Axis SHA-340 must only be operated behind a protective device according to EN 292-2 Section 4.2.2.3.
- Realize a low-vibration Quick-Set construction.

##### Installation position and assembly

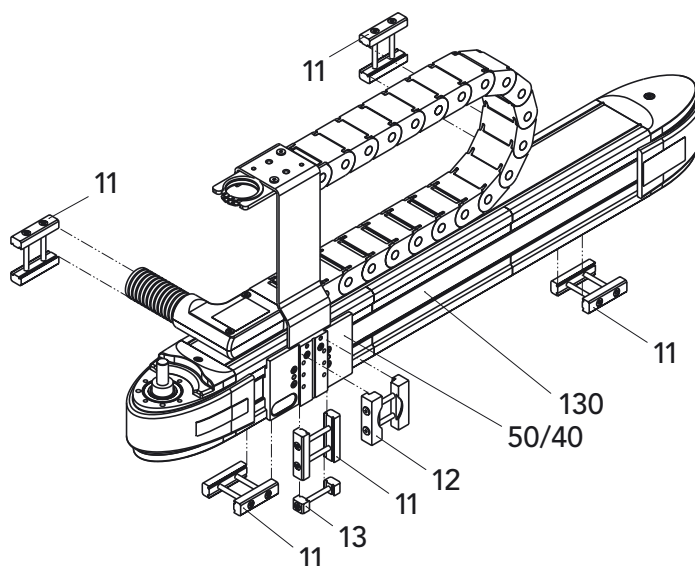
Tool required	Dimension	Use for
Hexagon socket wrench	4 mm	All Quick-Set® tension elements

The Servo Horizontal Axis SHA-340 is installed horizontally so that the two dovetail guides of the bearing housing are in a horizontal position. Fastening is performed by means of the lower or rear dovetail guide of the bearing housing (Item 130) using at least two Quick-Set tension elements SLL-55 (Item 11).

The additional equipment is mounted by means of the dovetail guide on the adapter plate (Item 50/40) with the aid of a tension element SLL-55 (Item 11) or SLR-15 (Item 12). For greater rigidity, it is advisable to combine a tension element SLL-55 (Item 11) with a tension element SLL-20 (Item 13) (utilization of the whole dovetail guide length on the adapter plate (Item 50/40)). Tension elements SLL-55/22 and SLL-20/22 can be used for laying cables.

Alternatively, the fastening threads and the positioning holes in the adapter plate (Item 50/40) can be used (see dimensioned drawing, Fig. 2.1-1 or Fig. 2.2-1).

Fig. 3.1-1: Installation position and assembly

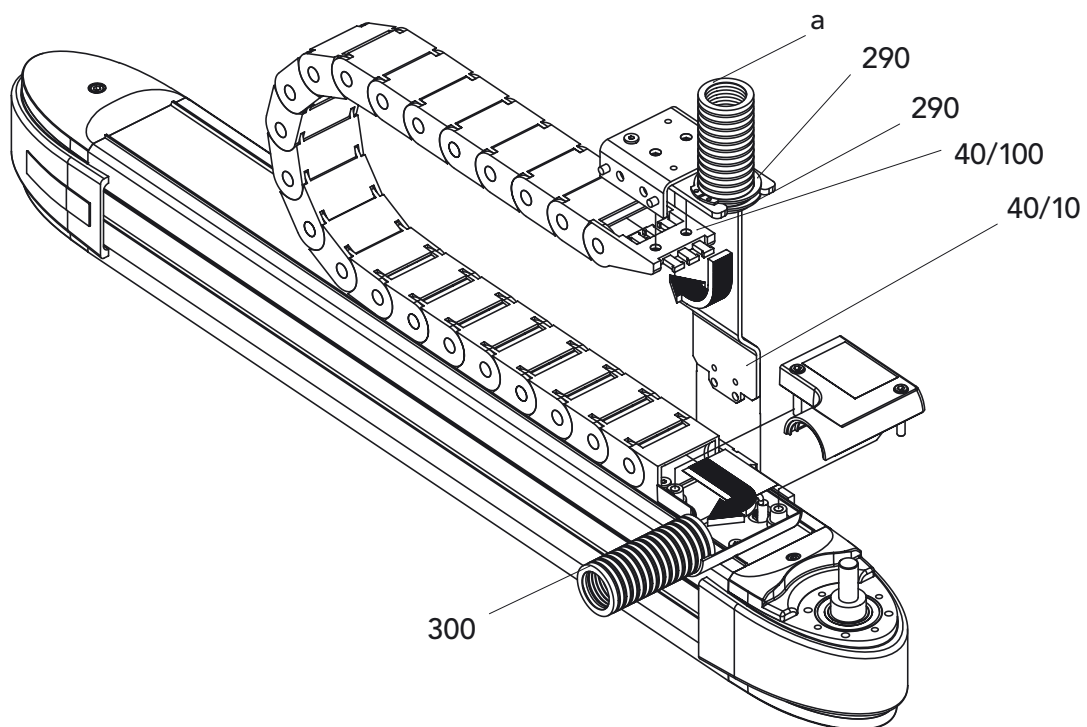


### 3.2 Laying cables and hoses from additional equipment

Cables and hoses from additional equipment can be led into the energy conducting carrier directly at the driver (Item 40/10) or can be led in a protected manner into the energy conducting carrier through a protective hose (Item a) which is fastened to the hose holder by means of separately supplied circlips (Item 290). A tension relief device can be mounted on the driver connection (Item 40/100).

The cables and hoses can be led through the opening in the duct halves into the protective hose (Item 300) or directly to the outside.

Fig. 3.2-1: Laying cables and hoses from additional equipment



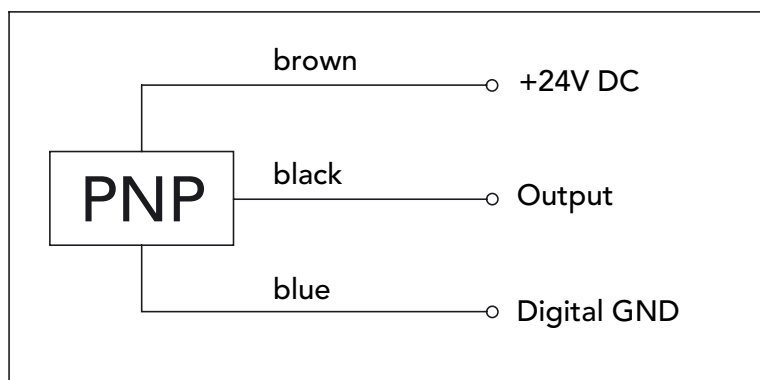
### 3.3 Connecting the inductive proximity switch



- **The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.**
- **Ensure that no unauthorized switching-on of the supply voltage can occur.**
- **Failure to observe these safety measures may result in death or severe personal injuries or material damage.**

- The length of the cable of the supplied inductive proximity switch is 5 m. The proximity switch cable is led through the opening in the duct halves into the protective hose (Item 300, Fig. 3.2-1) or, in the absence of a hose, directly to the outside.
- The wiring of the proximity switch corresponds to the following diagram, in accordance with the operating instructions for the servo amplifier. After wiring, check the function of the proximity switch.

Fig. 3.3-1: Connecting the inductive proximity switch



## 4 Maintenance

### 4.1 Lubrication



- The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.
- Ensure that no unauthorized switching-on of the supply voltage can occur.
- Failure to observe these safety measures may result in death or severe personal injuries or material damage.

Exclusively **Klüber oil "Paraliq P460"** (Montech Art.-No. 504721) may be used as lubricant.

- Lubrication interval: 800 operating hours
- Lubrication points: 4 lubricating nipples (Item 50/120, Fig. 4.1-2) on the slide (Item 50, Fig. 4.1-1)



**Procedure:**

- Move the slide (Item 50, Fig. 4.1-1) to the end position on the motor side.
- Remove the snapped-on covers (Item 150, Fig. 4.1-1) by pulling in the direction of the arrow.
- Move the slide in the region of the removed covers so that the four lubricating nipples (Item 50/120, Fig. 4.1-1) are accessible. Lubrication is performed using the felt wicks (Item 50/80, Fig. 6.5-1) which are pressed against the shafts (Item 140, Fig. 6.1-1) by springs (Item 50/110, Fig. 6.5-1).
- Replace covers (Item 150, Fig. 4.1-1) after the lubrication process.

Fig. 4.1-1: Snapped-on covers

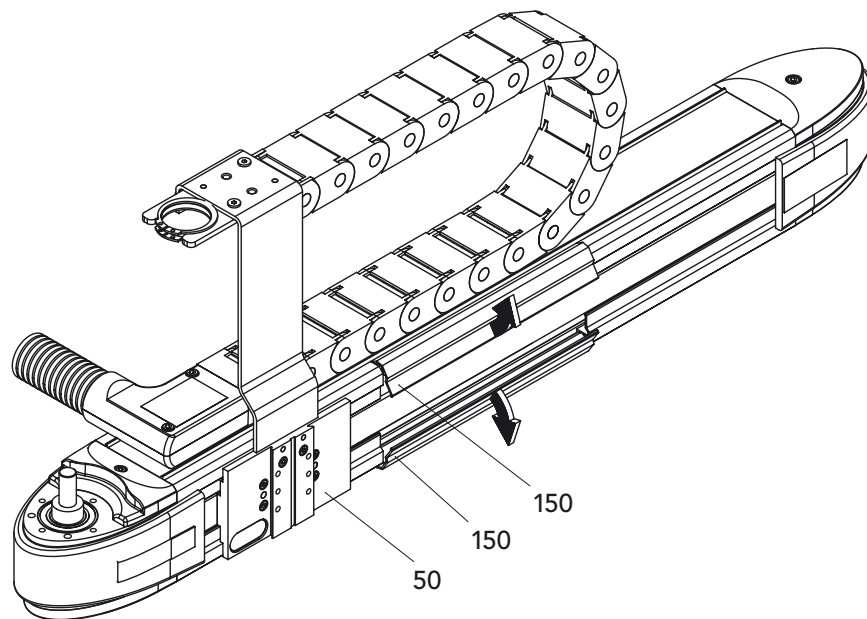
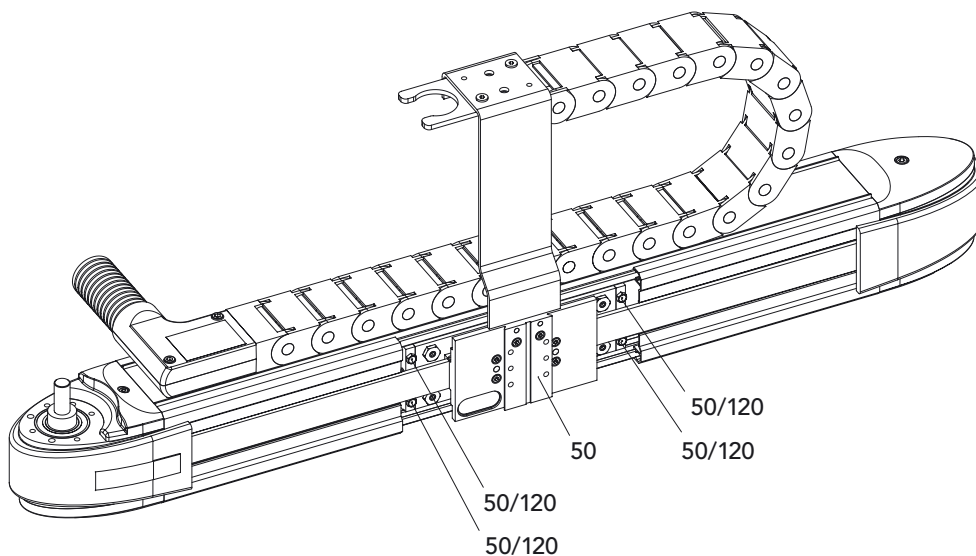


Fig. 4.1-2: Lubrication



## 4.2 Setting the slide play

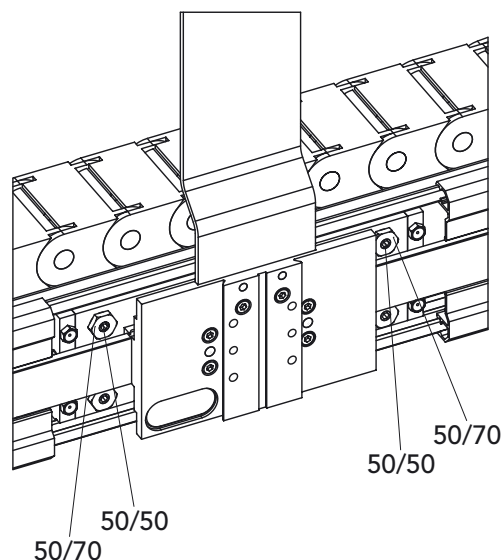


- The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.
- Ensure that no unauthorized switching-on of the supply voltage can occur.
- Failure to observe these safety measures may result in death or severe personal injuries or material damage.

Tool required	Dimension	Use for
Hexagon socket wrench	3 mm	Item 50/50
Fork wrench	12 mm	Item 50/70

- Move the slide (Item 50, Fig. 4.1-1) to the end position on the motor side.
- Remove the snapped-on covers (Item 150, Fig. 4.1-1) by pulling in the direction of the arrow.
- Move the slide in the region of the removed covers so that the hexagon nuts (Item 50/70, Fig. 4.2-1) are accessible.
- Slightly slacken the upper nuts (Item 50/70, Fig. 4.2-1).
- Set the rollers so that there is no play by turning the eccentric pins (Item 50/50, Fig. 4.2-1) clockwise (without pretension).
- Tighten the upper nuts (Item 50/70, Fig. 4.2-1) while holding the eccentric pins (Item 50/50, Fig. 4.2-1) with the hexagon socket wrench so that the tension nut position does not change.
- Replace covers (Item 150, Fig. 4.1-1) according to the setting procedure.

Fig. 4.2-1: Setting the slide play



### 4.3 Changing the inductive proximity switch

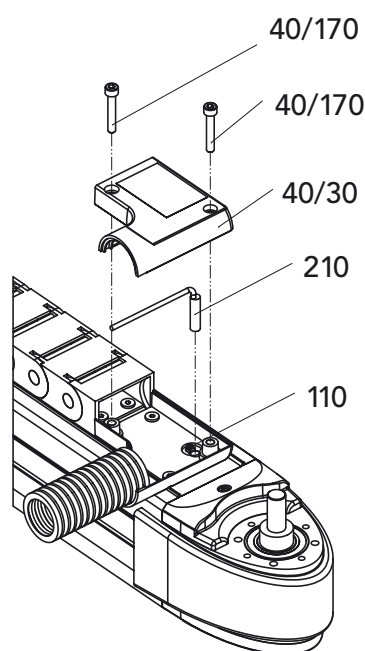


- The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.
- Ensure that no unauthorized switching-on of the supply voltage can occur.
- Failure to observe these safety measures may result in death or severe personal injuries or material damage.

Tool required	Dimension	Use for
Hexagon socket wrench	4 mm	Item 40/170
Hexagon socket wrench	2 mm	Item 110

- Undo the machine screws (Item 40/170) and remove the duct halves (Item 40/30).
- Undo the clamping screw (Item 110) and remove the proximity switch (Item 210).
- Push the new proximity switch (Item 210) to the stop in the hole in the bearing housing and fasten by slightly tightening the clamping screw (Item 110).
- Check for clearance by moving the slide body.
- Connect the inductive proximity switch (Item 210) according to the section "Connecting the inductive proximity switch".
- The LED on the proximity switch (Item 210) must light up with applied supply voltage if the carriage is in the end position on the motor side. If this condition is fulfilled, the reference traverse can be performed after the duct halves (Item 40/30) have been mounted.

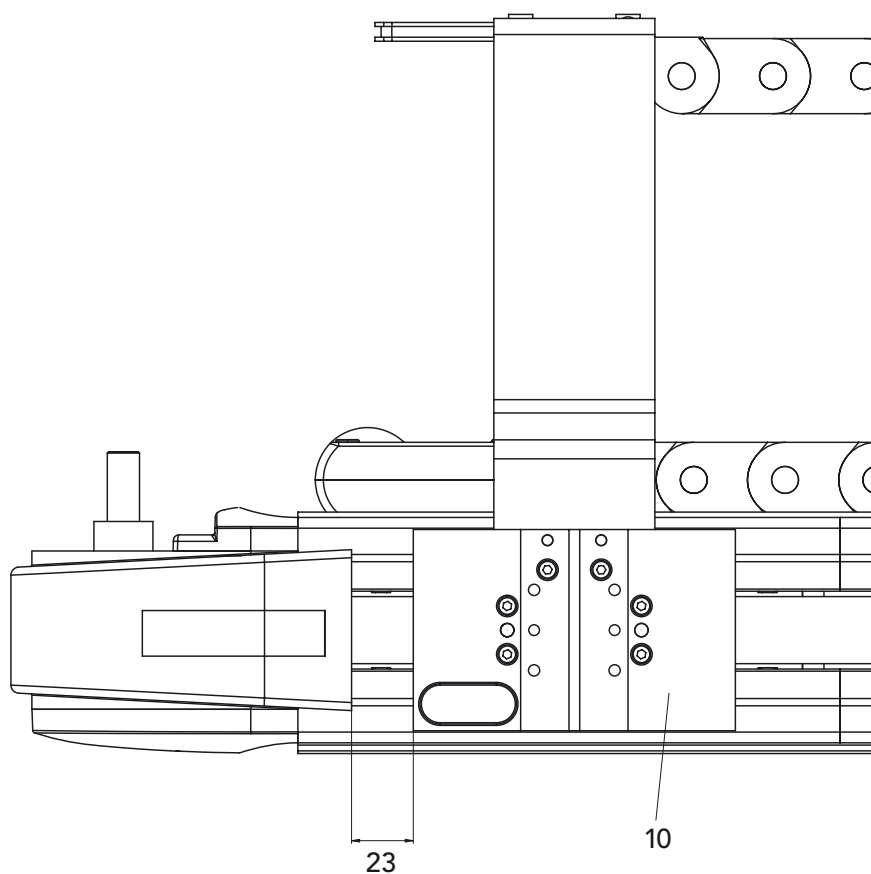
Fig. 4.3-1: Changing the inductive proximity switch



#### 4.4 Mechanical zero point of the slide

Position of slide when reference traverse is complete.

Fig. 4.4-1: Mechanical zero point of the slide



## 5 Replacing the guide elements and drive elements

### 5.1 Changing the toothed belt of the slide

- Carry out a reference traverse.
- Switch off the supply voltage.



- **The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.**
- **Ensure that no unauthorized switching-on of the supply voltage can occur.**
- **Failure to observe these safety measures may result in death or severe personal injuries or material damage.**

- Mark the position of the slide.
- Remove devices attached to the slide.
- Remove the snapped-on covers (Item 150, Fig. 4.1-1) by pulling in the direction of the arrow.
- Move the slide into the region of the removed covers.
- Undo screw (Item 20/170, Fig. 6.3-1) and remove cover (Item 20/60, Fig. 6.3-1).
- Undo hexagon nut (Item 20/150, Fig. 6.3-1) and completely relax the toothed belt by turning the camshaft (Item 20/30, Fig. 6.3-1).
- Undo machine screws (Item 50/170, Fig. 6.5-1) and unscrew by approx. 5 mm.
- Remove adapter plate (Item 50/40, Fig. 6.5-1) from the slide body (Item 50/10, Fig. 6.5-1) so that the toothed belt can be removed from the clamps (Item 50/30, Fig. 6.5-1).
- Fasten new toothed belt to the end of the old one. The adhesive tape must hold reliably, since otherwise extensive dismantling of the servo horizontal axis is required.
- Carefully draw the new toothed belt through the bearing housing (Item 130, Fig. 6.1-1) and remove the old toothed belt.
- Position the ends of the new toothed belt in the clamps (Item 50/30, Fig. 6.5-1) and fix with the adapter plate (Item 50/40, Fig. 6.5-1) by tightening the machine screws (Item 50/170, Fig. 6.5-1) (ensure vertical positioning of the toothed belt).
- Move the slide to the marked position without rotation of the motor shaft.
- Slightly tension the toothed belt by turning the eccentric shaft (Item 20/30, Fig. 6.3-1) and secure by tightening the hexagon nut (Item 20/150, Fig. 6.3-1).
- Snap covers (Item 150, Fig. 4.1-1) onto the bearing housing.
- Set toothed belt pretension according to "Setting the toothed belt pretension (slide)".
- Mount the cover (Item 20/60, Fig. 6.3-1).
- Check the work performed.
- Mount attached devices to the slide.
- Perform offset correction according to operator software manual "Commissioning after maintenance work".

## 5.2 Setting the toothed belt pretension (slide)

- Carry out a reference traverse.
- Switch off the supply voltage.



- **The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.**
- **Ensure that no unauthorized switching-on of the supply voltage can occur.**
- **Failure to observe these safety measures may result in death or severe personal injuries or material damage.**

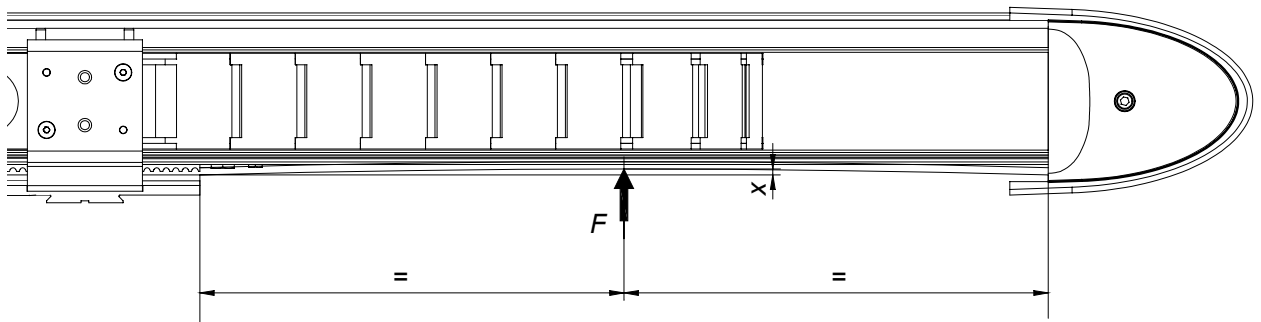
- Undo the machine screw (Item 20/170, Fig. 6.3-1) and remove cover (Item 20/60, Fig. 6.3-1).
- Undo hexagon nut (Item 20/150, Fig. 6.3-1).
- Set the toothed belt pretension according to the following table by turning the camshaft (Item 20/30, Fig. 6.3-1).
- Tighten the hexagon nut (Item 20/150, Fig. 6.3-1) while holding the camshaft (Item 20/30, Fig. 6.3-1) so that it cannot turn!
- Check the toothed belt pretension according to the following table.
- Replace cover (Item 20/60, Fig. 6.3-1).
- Perform offset correction according to the operator software manual "Commissioning after maintenance work".



The initial tensions shown in the table are maximum values. Subjecting the toothed belt to **higher initial tension** will result in **premature wear** of the toothed belt and **an increase in the noise level**.

Type	Initial tension [N]	Deflection force F [N]	Excursion x [mm]
SHA-340-400	200	19	9
SHA-340-600	200	11	9
SHA-340-800	200	8	9
SHA-340-1000	200	6	9
SHA-340-1200	200	4.8	9

Fig. 5.2-1: Setting the toothed belt pretension (slide)



### 5.3 Changing shafts and rollers

Always change the shafts (Item 140, Fig. 6.1-1) together with the associated rollers (Item 50/90, Fig. 6.5-1)!

#### 1. Removing the slide

- Carry out a reference traverse.
- Switch off the supply voltage.



- **The servo amplifier must be disconnected from the supply voltage. Switch off the main switch or main contact.**
- **Ensure that no unauthorized switching-on of the supply voltage can occur.**
- **Failure to observe these safety measures may result in death or severe personal injuries or material damage.**

- Mark slide position.
- Remove attached devices from the slide.
- Undo machine screw (Item 20/170, Fig. 6.3-1) and remove cover (Item 20/60, Fig. 6.3-1).
- Undo machine screw (Item 230, Fig. 6.1-1) and remove cover (Item 70, Fig. 6.1-1) (mounted only on deflection side or right deflection unit (Item 20, Fig. 6.1-1)).
- Relax toothed belt (Item 170, Fig. 6.1-1) by undoing the hexagon nut (Item 20/150, Fig. 6.3-1) and turning the camshaft (Item 20/30, Fig. 6.3-1).
- Move the slide by hand to the end position on the deflection side.
- Undo machine screws (Item 50/170, Fig. 6.5-1) and remove together with the adapter plate (Item 50/40, Fig. 6.5-1), thereby releasing the toothed belt (Item 170, Fig. 6.1-1).
- Undo machine screws (Item 20/180, Fig. 6.3-1) and remove deflection shaft assembly (Item 20, Fig. 6.1-1), if possible without unhooking the toothed belt.
- Push slide out of the bearing housing (Item 130, Fig. 6.1-1) (pay attention to the position of the felt wicks (Item 50/80, Fig. 6.5-1)).

#### 2. Changing the rollers (Fig. 6.5-1)

- Unscrew camshaft (Item 50/50) or concentric shaft (Item 50/60) from the nut (Item 50/70). For this purpose, hold the hexagon socket of the camshaft or concentric shaft with a hexagon socket wrench size 3 mm.
- Change the rollers (Item 50/90) (always change all rollers).
- Mount concentric shaft (Item 50/60), shim ring (Item 50/100), roller (Item 50/90) and nut (Item 50/70) and tighten. Apply opposing force by holding with hexagon socket wrench.
- Mount camshaft (Item 50/50), shim ring (Item 50/100), roller (Item 50/90) and nut (Item 50/70) (cam in lower position). Tighten the nut only lightly. This will be tightened only when the slide play has been set.



### 3. Changing the shafts (Fig. 6.1-1)

The shafts (Item 140) can be withdrawn from the grooves in the bearing housing on the side of the deflection roller. If the shafts cannot be pulled out when the servo horizontal axis is mounted, remove the axis from the installation.

- Pull out shafts (Item 140).
- Clean grooves in bearing housing (Item 130).
- Push in new shafts as far as they will go.

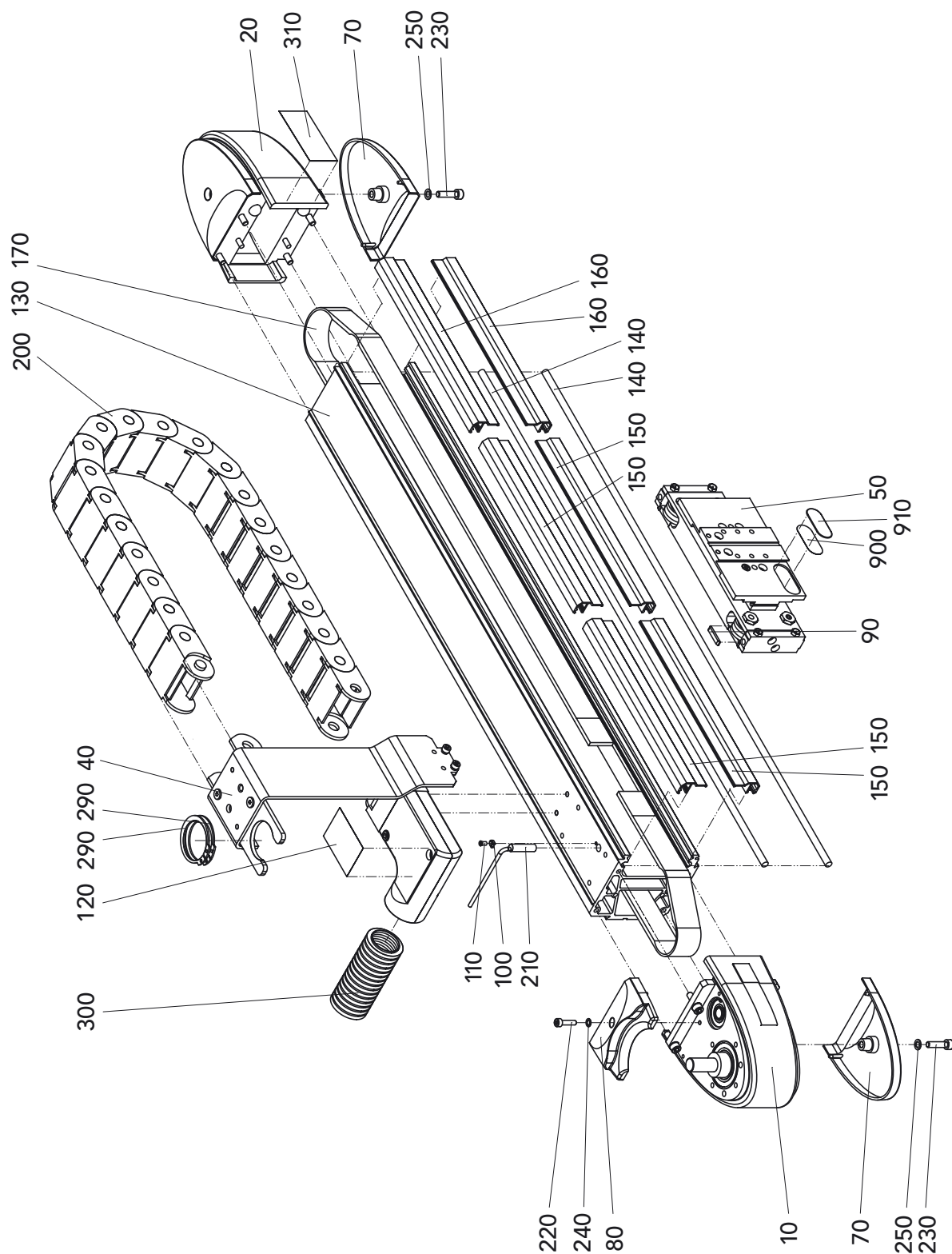
### 4. Final assembly

- Push slide (Item 50, Fig. 6.1-1) into the bearing housing (Item 130, Fig. 6.1-1) paying attention to the position. **Important: Pay attention to felt wicks and position of the rollers!**
- Eliminate slide play according to "Setting the slide play" (covers (150) not yet mounted).
- Insert the toothed belt (Item 170, Fig. 6.1-1) in deflection assembly (Item 20, Fig. 6.1-1) and screw deflection assembly to the bearing housing (Item 130, Fig. 6.1-1).
- Position the ends of the toothed belt in the clamps (Item 50/30, Fig. 6.5-1) and fix with the adapter plate (Item 50/40, Fig. 6.5-1) by tightening the machine screws (Item 50/170, Fig. 6.5-1) (ensure vertical positioning of the toothed belt).
- Push the carriage to the marked position without rotating the motor shaft.
- Snap covers (Item 150, Fig. 6.1-1) onto the bearing housing.
- Set toothed belt pretension according to "Setting the toothed belt pretension (slide)".
- Mount cover (Item 70, Fig. 6.1-1).
- Mount cover (Item 20/60, Fig. 6.3-1).
- Check the work performed.
- Mount attached devices to the slide.
- Perform offset correction according to operator software manual "Commissioning after maintenance work".

## 6 Spare parts list

### 6.1 Servo Horizont Axis SHA-340 without servo motor

Fig. 6.1-1: Drawing SHA-340-...-OZ



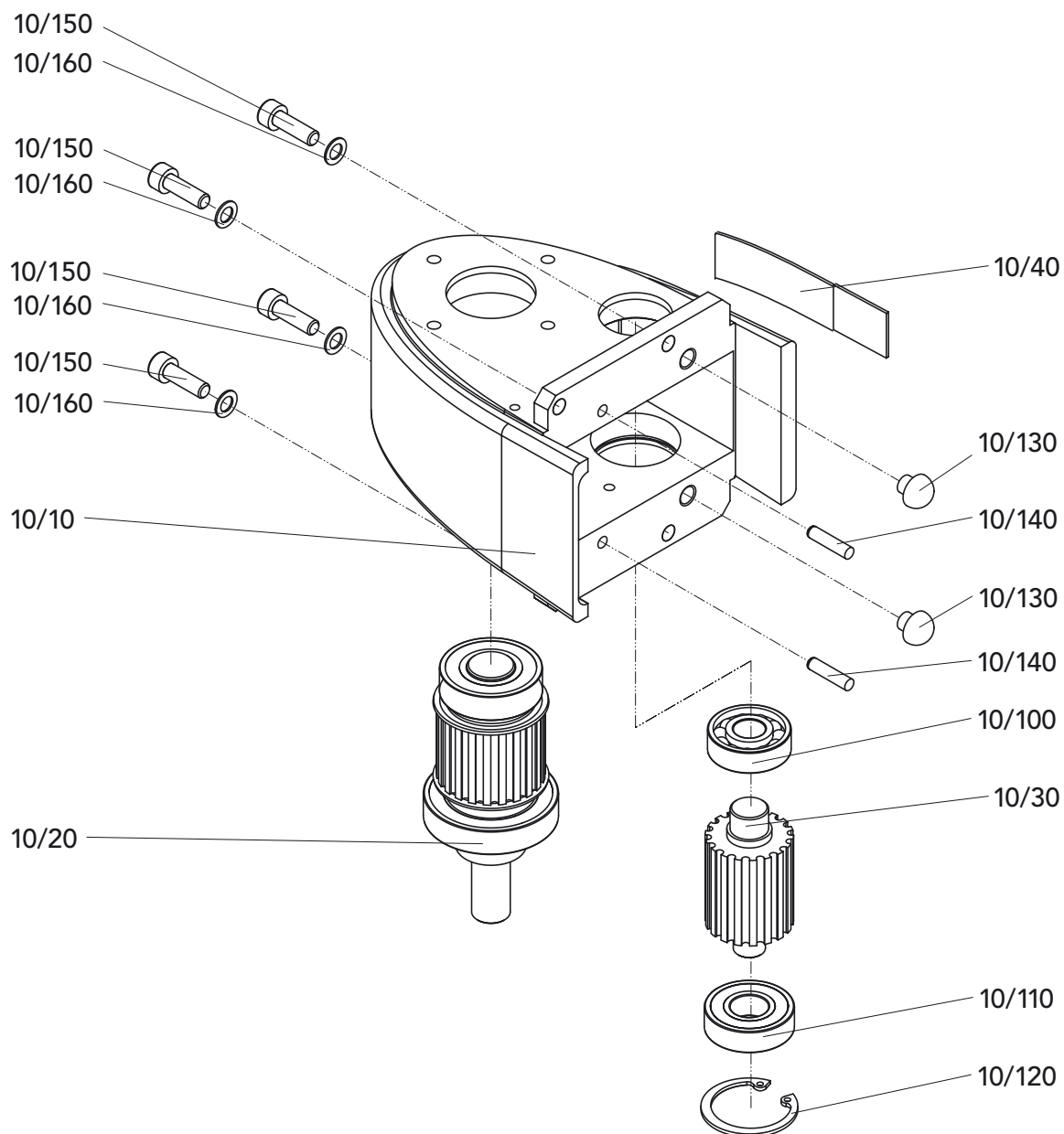
### 6.1.1 Spareparts list SHA-340-...-OZ

Item	Designation	Art. No.					Material
	SHA-340-	-400	-600	-800	-1000	-1200	
10	Left drive assembled	56363	56363	56363	56363	56363	Various
20	Right deflection unit assembled	56362	56362	56362	56362	56362	Various
40	Hose holder assembled	56364	56364	56364	56364	56364	Various
50	Slide assembled	50379	50379	50379	50379	50379	Various
70	Cover	50588	50588	50588	50588	50588	ABS lack.
80	Cover small	51356	51356	51356	51356	51356	ABS lack.
90	Damping plate	50382	50382	50382	50382	50382	Steel
100	Clamping piece	47906	47906	47906	47906	47906	Steel
110	Clamping screw	47904	47904	47904	47904	47904	Steel
120	Lubrication plate	50541	50541	50541	50541	50541	PVC
130	Bearing housing SHA-340	50505	50523	50524	50525	50526	Aluminium
140*	Shaft Ø6h6	50948	50527	50528	50529	50535	Steel
150	Cover SHA-340	50515	50515	50515	50515	50515	Aluminium
160	Cover SHA-340	50515	50516	50517	50518	50519	Aluminium
170*	Toothed belt	50595	50596	50597	50598	50599	PUR
200	Energy conducting carrier link	508125	508125	508125	508125	508125	PA
210*	Proximity switch	508842	508842	508842	508842	508842	Various
220	Machine screw M4x16	505328	505328	505328	505328	505328	Steel
230	Machine screw M5x20	504799	504799	504799	504799	504799	Steel
240	Ribbed washer M4	502606	502606	502606	502606	502606	Steel
250	Ribbed washer M5	505254	505254	505254	505254	505254	Steel
290	Circlip ø35 f.s.	502461	502461	502461	502461	502461	Steel
300	Protective hose PG29	503693	503693	503693	503693	503693	PA
310	Load warning plate	56180	56180	56180	56180	56180	Polyester
900	Type plate	41620	41620	41620	41620	41620	Polyester
910	Type plate plaque	48508	48508	48508	48508	48508	PUR

\* Are wear parts and on stock.

## 6.2 Left drive assembled

Fig. 6.2-1: Drawing Left drive assembled

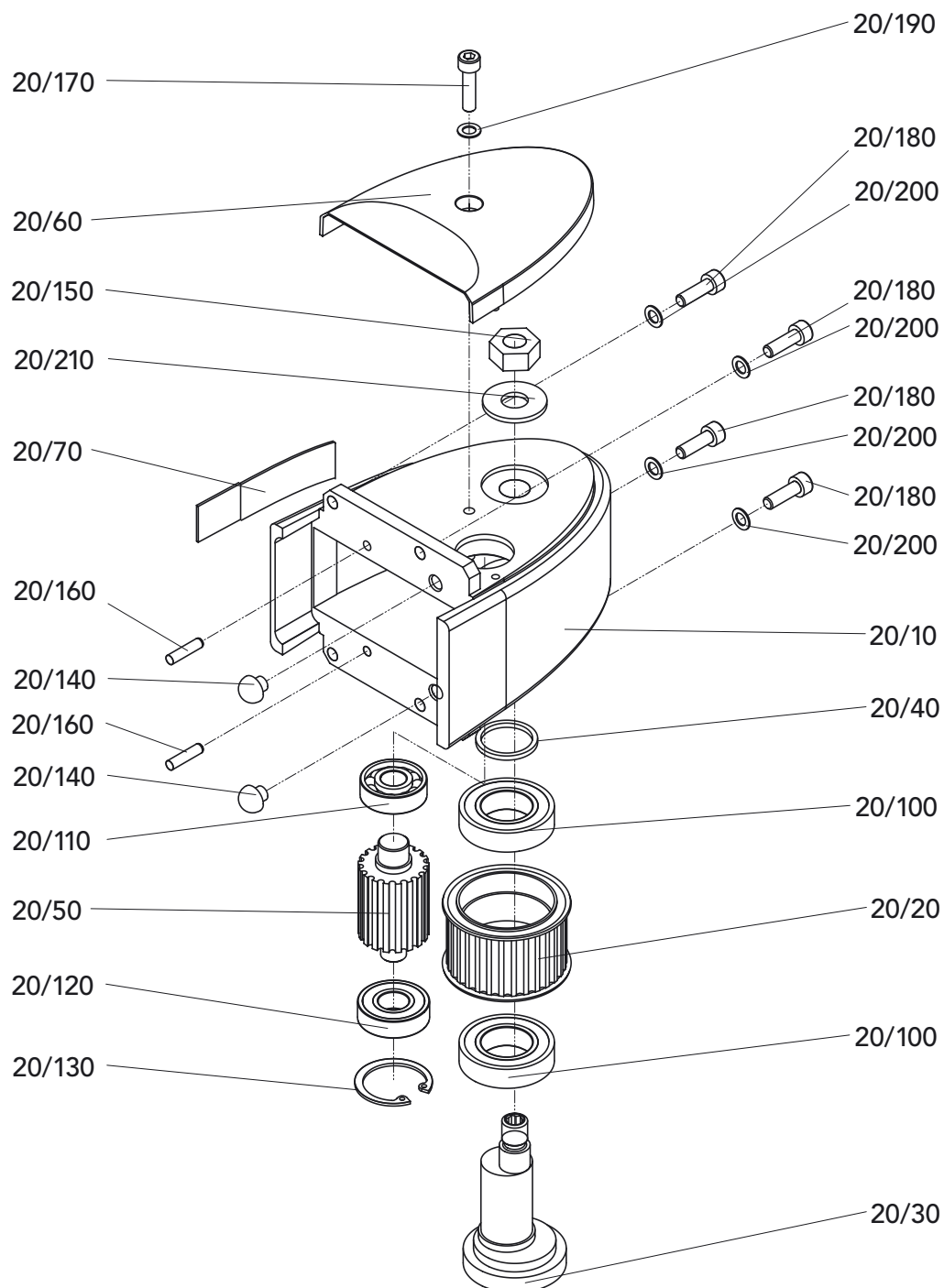


### 6.2.1 Spare parts list Left drive assembled

Item	Designation	Art. No.	Material
<b>10</b>	<b>Left drive assembled</b>	<b>56363</b>	
10/10	Housing for left drive	50493	Aluminium
10/20	Gear shaft assembled	50522	Steel
10/30	Deflection axle assembled	50521	Steel /Aluminium
10/40	Montech logo	50536	PVC
10/100	Deep-groove ball bearing 6000-2RS	501378	Steel
10/110	Deep-groove ball bearing 6001-2Z	505244	Steel
10/120	Circlip ø28 f.B	502474	Steel
10/130	Plug-in stop round	506160	NR
10/140	Straight pin Ø4x18h6	502039	Steel
10/150	Machine screw M5x16	501640	Steel
10/160	Ribbed washer M5	502365	Steel

### 6.3 Right deflection unit assembled

Fig. 6.3–1: Drawing Right deflection unit assembled

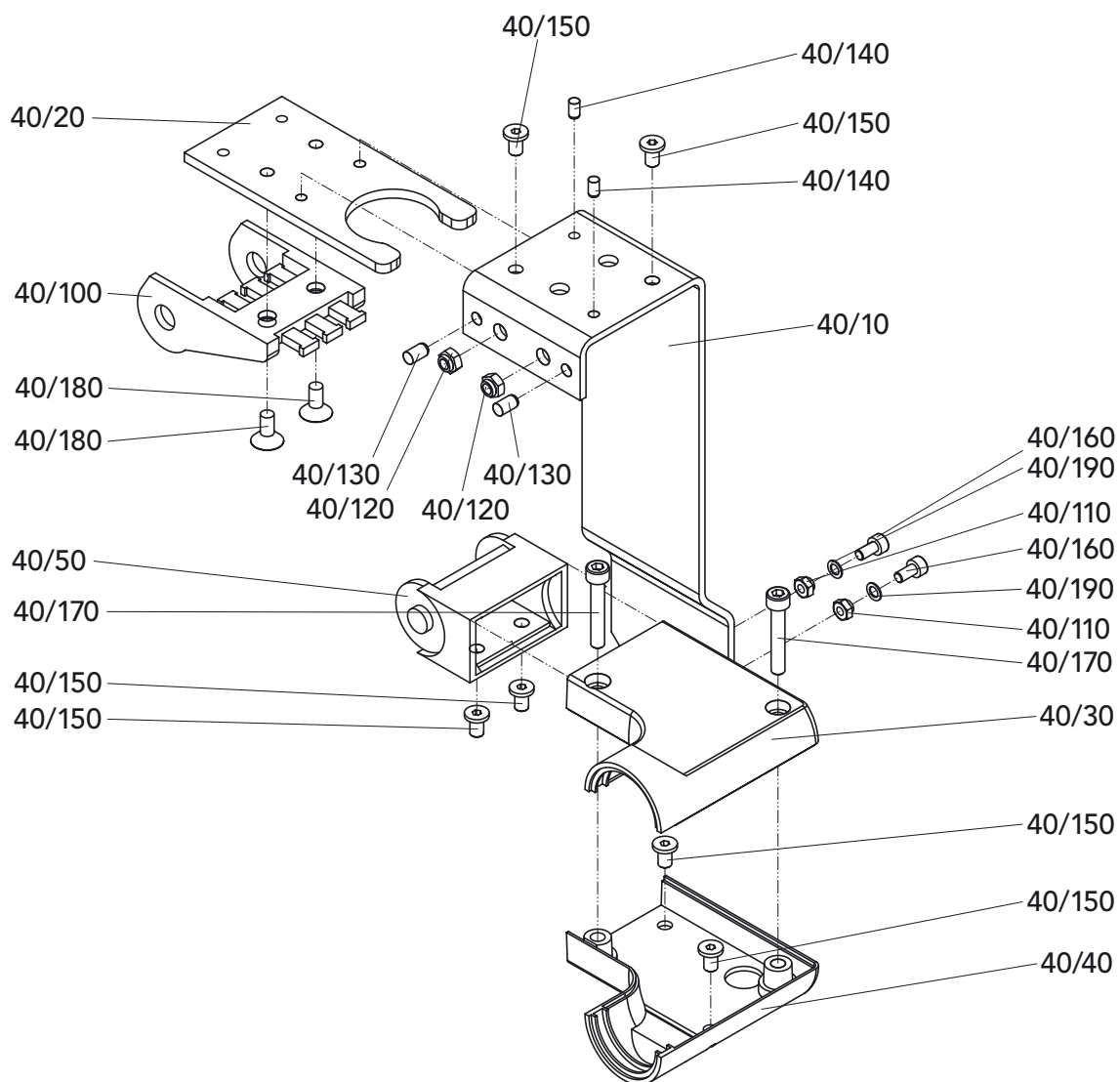


### 6.3.1 Spare parts list Right deflection unit assembled

Item	Designation	Art. No.	Material
<b>20</b>	<b>Right deflection unit assembled</b>	<b>56362</b>	
20/10	Housing deflection unit right	50492	Aluminium
20/20	Toothed disc 5MR-30S	50458	Aluminium
20/30	Eccentric shaft	50455	Steel
20/40	Distance ring	50353	Steel
20/50	Deflection axle assembled	50521	Steel /Aluminium
20/60	Cover	50588	ABS lack.
20/70	Montech logo	50536	PVC
20/100	Deep-groove ball bearing 6904-RS	508130	Steel
20/110	Deep-groove ball bearing 6000-2RS	501378	Steel
20/120	Deep-groove ball bearing 6001-2Z	505244	Steel
20/130	Circlip ø28 f.B	502474	Steel
20/140	Plug-in stop round	506160	NR
20/150	Hex nut M10x1	508132	Steel
20/160	Straight pin Ø4h6x18	502039	Steel
20/170	Machine screw M5x20	504799	Steel
20/180	Machine screw M5x16	501640	Steel
20/190	Ribbed washer M5	505254	Steel
20/200	Ribbed washer M5	502365	Steel
20/210	Washer 10.5/25x2	502589	Steel

## 6.4 Hose holder assembled

Fig. 6.4–1: Drawing Hose holder assembled



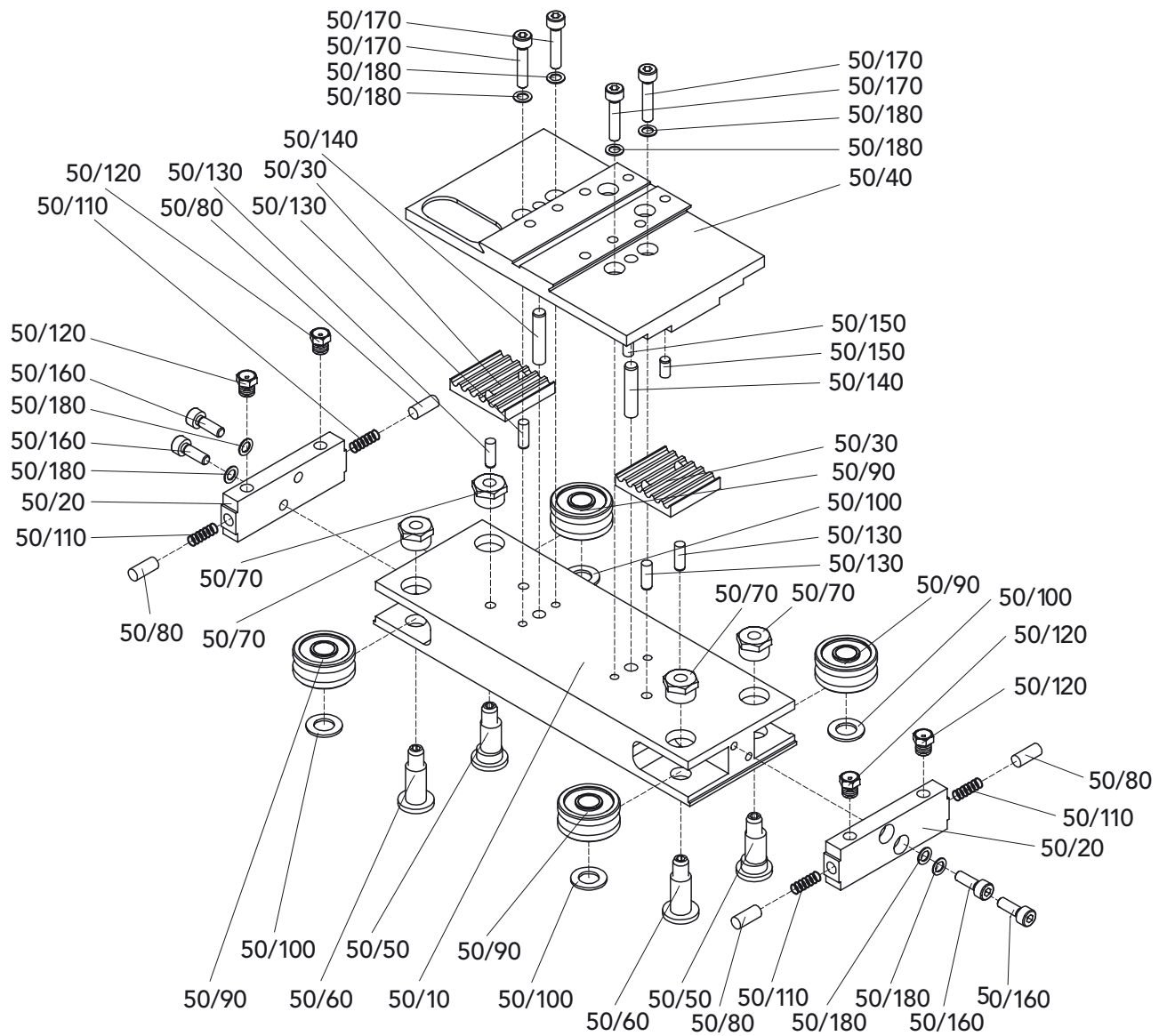


#### 6.4.1 Spare parts list Hose holder assembled

Item	Designation	Art. No.	Material
<b>40</b>	<b>Hose holder assembled</b>	<b>56364</b>	
40/10	Driver	50449	Steel
40/20	Hose holder	50452	Aluminium
40/30	Duct half	50498	ABS
40/40	Duct half left	50508	ABS
40/50	Fixed connection	50506	PA
40/100	Driver connection	508124	PA
40/110	Setting nut M4	502615	Steel
40/120	Setting nut M5	502614	Steel
40/130	Straight pin Ø5h6x10	502047	Steel
40/140	Straight pin Ø4h6x8	502032	Steel
40/150	Machine screw M5x8	506668	Steel
40/160	Machine screw M4x8	501618	Steel
40/170	Machine screw M5x30	501768	Steel
40/180	Countersunk screw M6x12	501823	Steel
40/190	Ribbed washer M4	502364	Steel

## 6.5 Slide assembled

Fig. 6.5-1: Drawing Slide assembled



### 6.5.1 Spare parts list Slide assembled

Item	Designation	Art. No.	Material
<b>50</b>	<b>Slide assembled</b>	<b>50379</b>	
50/10	Slide body	50356	Aluminium
50/20	End plate	50363	Aluminium
50/30	Clamp	50357	Aluminium
50/40*	Adapter plate	50361	Aluminium
50/50*	Eccentric pin assembled	50374	Steel
50/60*	Concentric pin assembled	50375	Steel
50/70*	Nut	50358	Steel
50/80*	Felt wick	40921	Wool felt
50/90*	Roller	503663	Steel
50/100*	Shim ring Ø8/14x1	505919	Steel
50/110*	Pressure spring	504119	Steel
50/120*	Lubrication nipple	504554	Brass
50/130	Straight pin Ø4x12h6	502035	Steel
50/140	Straight pin Ø5x24h6	506164	Steel
50/150	Straight pin Ø4x 8h6	502032	Steel
50/160	Machine screw M4x12	501620	Steel
50/170	Machine screw M4x20	501624	Steel
50/180	Ribbed washer M4	502364	Steel
* Are wear parts and on stock.			

## **7 General information**

### **7.1 Environmental compatibility and disposal**

#### **Material used**

- Aluminium
- Steel
- Brass
- Wool fibres
- Polyester
- ABS (Acrylonitrile-butadiene-styrene)
- PUR (Polyurethane)
- PA (Polyamide)
- PVC (Polyvinyl chloride)
- NR (Natural rubber)

#### **Surface treatment**

- Anodic oxidation of aluminium
- Blackening of steel
- Coating of aluminium and plastic

#### **Shaping processes**

- Profile extrusion of aluminium
- Casting of aluminium
- Material-removing processes (metals and plastics)
- Injection moulding of plastics

#### **Emissions during operation**

- None

#### **Disposal**

Servo Horizontal Axes (SHA-340) or handling units upgraded to portal loaders that are no longer in use are to be dismantled and recycled according to the type of material. The type of material for each part is stated in the spare parts list. Any non-recyclable material is to be disposed of properly according to materials, taking into account the regulations which apply in your location.

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